

# Descriptions of Eight New Species of Fishes from Japan.

BY

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## 1. *Lestidium japonicum*, *n. sp.* (Paralepididæ.)

Head 5 to  $5\frac{1}{8}$ , height of body without ventral keel  $17\frac{2}{3}$ , the same including the keel about 15 in total length without caudal; eye  $6\frac{1}{3}$ , interorbital 10 to 14, snout 2 in head.

Body elongate, compressed, deepest at nape, tapering very gradually to the very narrow caudal peduncle. Head long, its posterior parts compressed. Eye lateral, high up, impinging on upper profile, its vertical diameter exceeding the horizontal diameter; interorbital space slightly concave. Mouth wide, scarcely extending to vertical through anterior rim of orbit. Lower jaw slightly longer than upper jaw but included by the latter; the anterior arched portion of premaxillaries toothless; near the front, on each side, is a long, depressible canine, preceded by one or two much smaller, depressible teeth; behind these, after a short toothless interval, is a single series of short fixed teeth; mandibular teeth in 2 series,—an outer row of short, fixed teeth and an inner row of longer, canine-like, depressible teeth; canines widely spaced, about 9 in number on each side; palatine teeth similar, arranged in 2 series,—an inner series with large, canine-like, depressible teeth, about 6 to 9 in number on each side and an outer series consisting of short, fixed teeth, extending backward farther than the inner series; vomer toothless; on each side near the median part of tongue a longitudinal series of small depressible teeth. Dr. Gilbert says\* that in his *nudum* a subocular photophore is distinctly

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\* Gilbert—Bull. U.S. Fish Commission for 1903, pt. II, 1905, p. 608.

present but the specimens, 2 in all, of the present species seem not to possess an organ of the kind.

Dorsal inserted slightly nearer to origin of anal than to that of ventral and also slightly nearer to tip of pectoral than to base of caudal. Ventral inserted nearer to posterior nostril than to base of caudal. Caudal forked, with well developed rays which reach to base of anal. Vent represented by a longitudinal slit, overlapped by the short ventral fins. Adipose fin small, inserted before last anal ray. Lateral line incomplete, ending behind middle of anal fin.

Colour in formalin translucent, the back being somewhat darker; sides of snout blackish. A small black spot directly in front of eye and a rather faint one immediately below it. Opercles externally bright silvery, internally blackish. Median line of abdomen blackish, with a median narrow whitish space backward from vertical through tip of pectoral; caudal peduncle washed with blackish and silvery, this area extending forward to middle of anal. Peritoneum black; fins largely translucent, slightly dusky. Caudal and anal slightly blackish, the anterior part of anal black-punctate at base; ventral similarly marked at base.

The species differs from *Lestidium nudum* Gilbert in having insertion of dorsal nearer to origin of anal than to that of ventral, in longer base of anal and in rather smaller head.

Two specimens were captured in Sagami Sea by Mr. Aoki in 1908. Both are contained in the Zoological Museum of the Science College, the register number of the type being 2013.

*Measurements of Lestidium japonicum.*

Specimen	A.	B. (Type.)
Total length exclusive of caudal .. .. .	19.0 cm.	17.4 cm.
Height of body (without abdominal keel) .. .. .	1.1 "	1.0 "
Height of body (including abd. keel) .. .. .	1.2 "	1.2 "

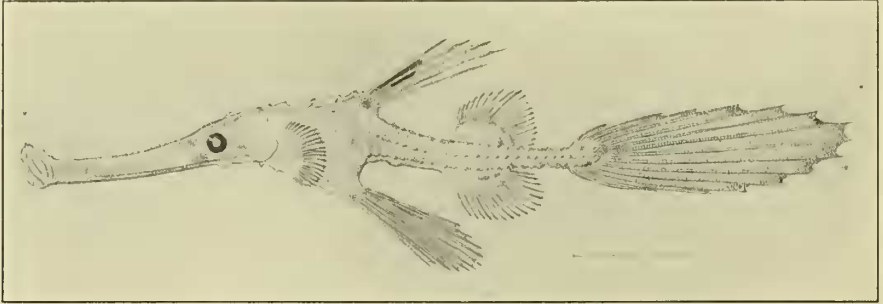
Length of head (measured from tip of snout).. . . . .	3.8 cm.	3.4 cm.
Horizontal diameter of orbit . . . . .	0.6 "	0.55 "
Interorbital width . . . . .	0.4 "	0.3 "
Length of snout . . . . .	2.0 "	1.7 "
Length of pectoral . . . . .	1.6 "	1.4 "
Distance from tip of mouth to its corner . . . . .	1.9 "	1.65 "
Distance from tip of mouth to origin of pectoral.. . . .	4.1 "	3.5 "
Distance tip of mouth to origin of ventral . . . . .	9.8 "	9.0 "
Distance from origin of pectoral to origin of ventral.	5.7 "	5.2 "
Distance from origin of ventral to origin of anal. . . . .	4.0 "	3.5 "
Distance from origin of ventral to base of caudal . . . .	9.4 "	8.0 "
Number of dorsal rays . . . . .	9	10
Number of anal rays . . . . .	49	42
Number of ventral rays . . . . .	9 or 10	9 or 10
Number of pectoral rays . . . . .	11	10 or 12

## 2. *Solenostomus leptosoma*, *n. sp.* (Solenostomidæ.)

Head  $2\frac{3}{8}$ , height of body  $5\frac{1}{4}$ , height of caudal peduncle  $27\frac{1}{2}$  in total length without caudal; eye  $7\frac{3}{8}$ , interorbital  $11\frac{1}{2}$ , snout  $1\frac{1}{8}$  in head; height of snout at middle of its length 7 in the length. D. V—19. A. 16. V. 7. P. ca. 23.

Body elongate, much compressed; its highest part at origin of first dorsal; height of body before anal equal to diameter of eye; caudal peduncle very slender, compressed; its length slightly longer than base of second dorsal. Head moderate in size; eye lateral, high, rather large; interorbital deeply concave; a longitudinal ridge with sharp spinules runs antero-posteriorly on outer boundary of interorbital; this ridge, running forward and meeting with its opposite fellow at the end

of the second third of snout length, becomes a median line that runs along back of snout. Posteriorly the interorbital ridges slightly



*Solenostomus leptosoma* Tanaka. Type.

converge toward each other down to end of occipital region, whence they continue farther as parallel ridges along the back. On nape a median ridge with retrorse spinules runs backward, ending at origin of first dorsal. Occipital part translucent, so that the brain is faintly visible through skin. Snout compressed, long, slender, tubular; the preorbital part steep in upper profile; outside the point of meeting of the ridges running forward from interorbital, a bundle of about 3 small hooked spines is present. The above-mentioned ridge with spinules runs along back of snout and stops at a point about half way in the length of snout. Outside this ridge there run the upper, lateral, spineless ridges parallel with each other, leaving a narrow area between them. Lower lateral and mandibular ridges without spines. Mouth terminal, directed upward; its cleft measured from tip of snout to corner of mouth equal to interorbital width. Body with several rows of spinules. Before first dorsal and ventral, a median ridge with spinules; upper lateral, middle and lower lateral ridges present, forming 4 parallel series of plates on each side of body. Behind first dorsal and ventral, median ridges absent, but behind anal a rudimentary ridge reappears on belly. A series of plates on body, 32 in number, of which 4 are before first dorsal, 6 between the origin of first dorsal and vent, 22 between vent and caudal base including vent. First dorsal extends over one and a half plate; second dorsal and anal

over 7 plates. First dorsal high, acutely pointed, its tip reaching beyond middle of base of second dorsal when folded backward; length of the longest spine equal to half length of head. Second dorsal rounded in margin, rather low, its highest ray twice as long as diameter of eye. Anal same as second dorsal in form and height; both these fins not quite reaching base of caudal with their posterior free end in the depressed state. Pectoral short, slightly longer than diameter of eye. Ventral long, ending in the same vertical as the tip of first dorsal and extending to middle of base of anal; its insertion nearer to base of caudal than tip of snout by twice eye diameter. Caudal long, slightly longer than the length from posterior rim of eye to origin of anal.

Colour in spirit light yellow, with dusky colouration here and there. First dorsal rather dusky, 2 long black ocelli on interradial membrane between first and third spines, the posterior one being smaller; caudal dusky, posteriorly darker. Second dorsal, anal and pectoral of a light colour. Ventral slightly dusky, posteriorly darker.

The species seems to be allied to *Solenostoma brachyurum* Bleeker described in Günther's Catalogue, but differs from it in colouration, especially in that of first dorsal on which occur 2 distinct black spots in the present species.

Only a single specimen was obtained at Yodomi, Sagami Sea, in February 1908. It is registered No. 1784 in the Zoological Museum, Science College.

*Measurements of Solenostomus leptosoma.*

Total length ex. of caudal .. .. .	5.5 cm.
Height of body .. .. .	1.05 "
Height of body before anal .. .. .	0.3 "
Height of caudal peduncle .. .. .	0.2 "
Length of caudal peduncle .. .. .	0.7 "

Length of head .. .. .	2.3 cm.
Length of snout .. .. .	1.75 "
Horizontal diameter of eye .. .. .	0.3 "
Interorbital width .. .. .	0.2 "
Height of snout at middle of its length .. .. .	0.25 "
Height of first dorsal .. .. .	1.2 "
Length of ventral .. .. .	1.35 "
Length of caudal .. .. .	2.5 "
Distance from tip of snout to <i>first</i> dorsal .. .. .	3.25 "
Distance from eye to first dorsal .. .. .	1.45 "
Distance between 2 dorsals .. .. .	0.95 "

### 3. *Ctenogobius kurodai*, *n. sp.* (Gobiidae.)

Head  $3\frac{1}{2}$  to  $3\frac{1}{3}$ , height of body  $5\frac{1}{2}$  to  $5\frac{5}{6}$  in total length without caudal ; eye 4, interorbital  $6\frac{2}{3}$  to 7, snout 4 to 5, maxillary  $2\frac{1}{2}$ ; height of caudal peduncle  $2\frac{1}{2}$  in head. D. VI—8 to 10. A. 8 to 9. P. 19. Scales in longitudinal series 28 to 30 ; same in transverse series 9 to 10.

Body rather elongate, highest at a short distance behind origin of pectoral ; caudal peduncle much compressed. Head moderate in size, depressed, about  $\frac{1}{6}$  less broad than long and about  $\frac{1}{4}$  less high than broad, upper contour gently convex, lower contour nearly horizontal ; eye rather small, high up, projecting above upper contour, obliquely directed ; interorbital flat ; snout slightly shorter than diameter of eye, upper profile in rather steep curve ; tip of snout pointed when viewed from side, broadly rounded when viewed from above. Mouth subinferior, slightly obliquely directed ; lower jaw slightly longer than the upper ; lips rather broad, reflected outward. Teeth on both jaws, all simple, in 2 rows, the outer teeth on upper jaw slender but much larger than inner ones ; outer series on lower jaw scarcely larger than inner series,

but without larger canines near angle of mouth; those on symphysis like those on side, but a little smaller; no teeth on vomer and palatines; tongue broad, slightly rounded or truncate at tip. Maxillary extending to vertical from anterior rim of orbit, entirely concealed under preorbital and lip. Anterior nostril with a long tube; posterior nostril without it. No barbel on chin; cheeks slightly tumid. Gill-opening lateral; isthmus broad, slightly shorter than postorbital part of head; gill-rakers on first gill-arch 7+10 in number, stumpy, very short; a large slit behind last gill; pseudobranchiae developed. Two dorsals well separated from each other though by a short space. Origin of first dorsal midway between tip of snout and posterior end of base of second dorsal, or above the beginning of the second half of pectoral. Origin of second dorsal nearer to caudal base than to posterior rim of eye by length of snout. In the first dorsal the third or fourth spine longest, equal to postorbital part of head, outer margin rather rounded, with the membrane between spines distinctly scalloped. Second dorsal slightly lower than the first, the highest ray being the sixth; the margin broadly rounded, but scarcely scalloped. Anal immediately behind vent, inserted below fourth ray of second dorsal; rays highest behind the middle part but somewhat shorter than the rays of second dorsal; the edge rounded, but not scalloped; both vertical fins not reaching to caudal base when folded backward. Pectoral rather large; no papilla on inner edge nor filamentous appendages above; rounded posteriorly, extending beyond vent. Ventral rather small, free to base, not reaching to vent, distance between tip of ventral and vent slightly less than one-half the distance between the former and the origin of ventral. Caudal rounded. Anal papilla well developed. Scales rather large, finely ctenoid; nape closely covered with smaller cycloid scales, but occipital parts naked. Throat before ventral with a very few number of small cycloid scales; breast behind ventral with small, cycloid scales. Opercles and cheeks naked. No lateral line.



Colour in formalin blackish above, paler below ; on median parts of body some six, indistinct dark blotches at somewhat equidistant intervals ; behind the posteriormost blotch of the series a very distinct dark blotch on caudal base. Above the series and on back some more blotches present. Second dorsal with about 5 oblique series of blackish spots, directed downward and backward ; broadly edged with whitish. Caudal dusky, with broad, whitish edge. Anal dusky, also with whitish, broad edge. Pectoral slightly dusky, with narrow whitish edge. Ventral dusky, with whitish edge. Head indistinctly spotted above, dusky or pale below ; 3 dark lines radiating from eye, of which one runs horizontally forward from eye and unites with the fellow of the other side on anterior edge of preorbital parts ; the second line runs forward and downward to reach angle of mouth ; the third goes backward and disappears at a point midway between its origin and the uppermost edge of opercle. Colouration and markings considerably vary with age. In a specimen 3.6 cm. long without caudal, markings of second dorsal indistinct, but almost uniformly dusky and with whitish edge ; markings of body and head very indistinct. In a specimen 2.7 cm. long without caudal, the markings are very distinct ; first dorsal and caudal showing the same markings as the second dorsal ; anal whitish or with same marking as in second dorsal ; pectoral whitish or with some rows of spots ; ventral whitish ; head with very distinct markings.

The species is quite distinct from any species of the genus hitherto known from Japan. The chief characteristics of the species are as follows: head broader than high ; snout short ; ventral small, not reaching to the perpendicular passing through tip of pectoral ; vertical fins all with a somewhat small number of rays ; nape closely scaled.

Numerous specimens from a fresh-water pond in the garden of Marquis Kuroda in Tokyo. The largest specimen, the type, is 3.6 cm. long without caudal ; it is contained in the Zoological Museum of the Science College, registered No. 2008. The species is named for Mr. N. Kuroda, by whom it was discovered.



*Measurements of Ctenogobius kurodai.*

Specimen	A.	B.	C.
Total length without caudal .. .. .	3.6 cm.	3.5 cm.	3.0 cm.
Height of body .. .. .	0.65 "	0.6 "	0.6 "
Height of caudal peduncle .. .. .	0.4 "	0.4 "	0.35 "
Height of head .. .. .	1.0 "	1.0 "	0.85 "
Length of snout .. .. .	0.25 "	0.25 "	0.2 "
Horizontal diameter of eye .. .. .	0.25 "	0.25 "	0.2 "
Interorbital width .. .. .	0.15 "	0.15 "	0.1 "
Length of maxillary .. .. .	0.4 "	0.4 "	0.3 "
Length of pectoral .. .. .	0.8 "	0.8 "	0.7 "
Length of ventral .. .. .	0.6 "	0.65 "	0.55 "

**4. *Ctenogobius katonis*, n.sp.** (Gobiidae)

Head  $3\frac{3}{4}$ , height of body  $4\frac{1}{2}$  in total length without caudal; eye  $4\frac{1}{2}$  to 5, interorbital about 6, snout  $2\frac{2}{3}$  to 3 in head.

Body rather elongate, slightly compressed; caudal peduncle compressed. Head rather large, its posterior part slightly depressed; eye moderate in size, its upper margin projecting above contour of head, directed obliquely, slightly nearer to tip of snout than to posterior edge of opercle; interorbital slightly narrower than diameter of eye, broadly convex; snout moderate in length, its upper contour gently curved, acutely pointed when viewed from side, broadly rounded when viewed from above. Anterior nostril with a short tube, slightly nearer to tip of snout than to anterior rim of eye; posterior nostril almost tubeless, situated midway between the anterior nostril and the anterior rim of eye. Mouth slightly oblique; lower jaw slightly included; lips very broad, reflected outward. Maxillary extending to vertical through posterior nostril; entirely concealed by preorbital. Teeth on jaws in

2 rows; outer tooth being larger and somewhat incisor-like; inner tooth smaller and sharply pointed. Teeth on lower jaw slightly smaller and those of inner row somewhat truncate; on symphyisial parts the outer series is absent. None on vomer and palatines. Tongue broad, rounded at tip. Preopercle unarmed. Gill-openings separate, isthmus broad, the breadth equal to length of snout; gill-rakers on first gill-arch 4 + 8 in number, blunt, the length about  $\frac{1}{3}$  diameter of eye; pseudobranchiae developed; a slit behind last gill; branchiostegals 3 in number. Origin of dorsal slightly nearer to posterior end of base of second dorsal than to tip of snout, or above origin of the posterior half of pectoral; membrane between spines scalloped; the highest spines not reaching second dorsal. Second dorsal inserted very slightly nearer to upper edge of opercular flap than to base of caudal, the highest rays not reaching base of caudal, the margin rounded, but the membrane not scalloped between rays. Anal inserted below fourth ray of second dorsal and immediately below vent; the outline same as that of second dorsal, highest rays extending farther backward than those of second dorsal when folded, but not reaching base of caudal. Pectoral without silk-like rays in the upper part, its posterior margin rounded; distance between its posterior tip and vent equaling length of snout. Ventral below posterior end of base of pectoral; its disc slightly broader than long, extending to vertical through end of the second third of pectoral. Caudal very broadly rounded. Anal papilla well developed. Scales rather large, ctenoid. Nape closely scaled, the scales small and cycloid; occiput, cheek and opercle scaleless; throat before ventral with a very few number of small, cycloid scales; breast behind ventral also with small, cycloid scales. No lateral line.

Colour in formalin blackish brown above, pale below; about 7 indistinct cross patches at equal intervals along the median parts of body. Between these patches and back about 6, more indistinct patches present above interspaces of the former. Posterior parts of

belly and lower parts of caudal base with or without very indistinct patches. Nape, snout and cheek with dark, rivulate lines. Several dark lines radiate forward from eyes; under surface of head pale. First dorsal dusky, with faintly visible oblique lines and with a very indistinct narrow whitish edge. Second dorsal dusky, with narrow whitish outer edge; about 6 dark lines run obliquely downward and backward. Anal similarly coloured as second dorsal, but with more indistinct markings. Pectoral dusky, its proximal parts having 2 dark cross-lines, outer surface of the base with a very distinct dark patch at the upper end. Ventral dusky, without markings. Caudal dusky; with several, wavy, dark, cross bars; posteriorly very narrowly edged with whitish.

The species is very closely allied to *Rhinogobius nagoyae* Jordan & Seale but differs from this in having scaly nape and in the shorter maxillary which does not extend to the anterior rim of orbit.

Four specimens were collected from fresh-water in Kanazawa, Kaga, by Mr. K. Katō, instructor of natural history in the Middle School of that district, for whom the species is named. The type, 6.1 cm. long without caudal, is contained in the Zoological Museum, Science College, the register number being 2002. The species is locally known by the name of "Kin-kan," the meaning of which is uncertain.

*Measurements of Ctenogobius katonis.*

Specimen	A.(Type.)	B.	C.	D.
Total length ex. of caudal .. .. .	6.1 cm.	4.6 cm.	4.5 cm.	5.1 cm.
Height of body .. .. .	1.4 "	1.0 "	1.0 "	1.1 "
Height of caudal peduncle .. .. .	0.8 "	0.6 "	0.55 "	0.65 "
Length of head .. .. .	1.8 "	1.4 "	1.2 "	1.35 "
Horizontal diameter of eye .. .. .	0.35 "	0.25 "	0.3 "	0.3 "
Interorbital width .. .. .	0.35 "	0.2 "	0.2 "	0.35 "

Length of snout . . . . .	0.7 cm.	0.45 cm.	0.45 cm.	0.5 cm.
Distance between tip of snout and origin of first dorsal . . . . .	2.5 "	1.7 "	1.8 "	1.9 "
Distance between tip of snout and origin of second dorsal . . . . .	3.8 "	2.6 "	2.6 "	3.0 "
Distance between tip of lower jaw to origin of anal . . . . .	4.2 "	3.2 "	3.0 "	3.2 "
Distance between tip of lower jaw to origin of ventral . . . . .	1.9 "	—	1.25 "	1.5 "
Height of first dorsal . . . . .	1.0 "	0.55 "	0.6 "	0.6 "
Height of second dorsal . . . . .	0.9 "	0.5 "	0.7 "	0.75 "
Height of anal . . . . .	0.85 "	0.7 "	0.55 "	0.6 "
Length of pectoral . . . . .	1.6 "	1.1 "	1.1 "	1.2 "
Length of ventral . . . . .	0.85 "	—	0.7 "	0.7 "
Length of caudal (as measured to tip of the middle rays) . . . . .	1.2 "	0.8 "	0.85 "	1.0 "
Number of dorsal spines and rays . . . . .	VI-9	VI-8	VI-9	VI-9
Number of anal rays . . . . .	9	9	9	9
Number of pectoral rays . . . . .	19	20	20	20
Number of scales in lateral series . . . . .	33	32	31	30
Number of scales in transverse series . . . . .	12	12	12	12

### 5. *Zoarchias glaber*, *n. sp.* (Blenniidae.)

Head  $7\frac{1}{2}$ , height of body  $13\frac{1}{8}$  in total length as measured to tip of caudal; eye 4, interorbital  $9\frac{1}{8}$ , snout  $4\frac{2}{8}$ , length of maxillary  $1\frac{3}{8}$ , pectoral  $2\frac{4}{8}$  in head. D. XXXII, 86. A I, 93.

Body elongate, very much compressed, gradually narrowing towards the pointed tail. Head moderate, compressed anteriorly, but broad posteriorly, its width across at the broadest part  $2\frac{1}{3}$  in the length of head; eye high up, its upper rim above level of interorbital space; interorbital slightly concave; snout pointed. Mouth wide, the cleft on lower side of head, parallel to ventral outline. Jaws subequal, the maxillary extending beyond orbit, its length a little larger than half

the length of head. Teeth pointed, in narrow bands on jaws, vomer and palatines; gill-membranes forming a broad fold across the isthmus. Nostrils with tubes. Head naked; body with minute, circular, deeply imbedded scales; no lateral line.

Dorsal inserted above base of pectoral; the spines strong, curved, pungent, their length equal to one-half diameter of orbit; that of the rays equal to length of orbit; membrane of the fin thick anteriorly, posteriorly becoming somewhat thinner; not incised between spines or rays; both the spines and rays completely concealed; base of spinous part of fin occupying  $\frac{2}{3}$  the length from origin of the fin to tip of tail. Anal inserted immediately behind vent and about beneath the twenty-second spine of dorsal; the spine strong, equal in height to the rays which are somewhat higher than diameter of orbit; membrane of the fin not incised. Dorsal and anal confluent with caudal which is rather rounded. Pectorals rounded posteriorly. No ventrals.

Colour in formalin brownish, without markings throughout; head of same colour, without markings; occipital parts with a darker patch. Vertical fins all of similar colour, without markings except that there is a blackish oblong spot on the anteriormost rays of the spinous dorsal; pectoral pale, without markings.

The species is allied to *Zoarchias veneficus* Jordan & Snyder, but differs from this in having a somewhat larger number of spines and rays in vertical fins and especially in having no markings. The species also resembles *Zoarchias neglectus* Tanaka, differing however in showing no markings and in the number of spines and rays in vertical fins.

A single specimen was collected in Sagami Sea in 1908. It is contained in the Zoological Museum as the type of the species, the register number being 2011.

*Measurements of Zoarchias glaber.*

Total length (measured to tip of caudal) .. .. .	10.5 cm.
Height of body .. .. .	0.8 "

Length of head .. .. .	1.4 cm.
Horizontal diameter of eye .. .. .	0.35 "
Interorbital width .. .. .	0.15 "
Length of snout .. .. .	0.3 "
Length of maxillary .. .. .	0.85 "
Distance between tip of lower jaw and vent .. .. .	3.1 "
Distance between tip of lower jaw and origin of anal .. .. .	3.6 "
Length of pectoral .. .. .	0.5 "

### 6. *Carapus sagamianus*, *n. sp.* (Carapidae.)

Head  $9\frac{3}{4}$  to 10, height of body at insertion of anal 15 to 16 in total length; eye 4 to  $4\frac{2}{3}$ , interorbital 4 to  $4\frac{3}{4}$ , snout 4 to  $4\frac{2}{3}$ , maxillary 2 in head.

Body eel-shaped, compressed, tapering towards the long and slender tail. Head rather small, slightly higher than wide; eye moderate, impinging on the upper profile; interorbital broadly convex; snout sharply pointed when viewed from side, but rather broadly rounded when viewed from above. Mouth subinferior; lower jaw slightly included; maxillary extending to vertical through the posterior rim of orbit. Teeth on jaws small, pointed, in one row; palatine teeth slightly larger, arranged likewise in a single row; vomerine teeth slightly larger than palatine ones, in a narrow band, consisting of about 4 longitudinal rows. Dorsal inserted behind pectoral; distance from lower end of pectoral base to origin of dorsal equal to that from the former to tip of snout; height of the fin along the rays at the end of the first third of dorsal equal to diameter of orbit. Anal inserted behind pectoral, at vertical through the middle of its length, the height along the rays at its highest part equal to length of post-orbital part. Pectoral small, located somewhat low, sharply pointed posteriorly. Caudal small, confluent with the vertical fins. No ventral.

No scales; a series of pores on the side high, concurrent with back, posteriorly it is broadly curved downward and runs along middle of body.

Colour in formalin light brown, with profusely scattered dark spots; all the fins pale, without markings.

The species is allied to *Carapus kagoshimanns* (Steindachner & Döderlein), but differs from this in having smaller vomerine teeth, higher vertical fins, smaller pectorals and in the position of the insertion of anal; moreover the marking is very distinct from that of *Carapus kagoshimanns*.

The species is often taken from the cloaca of littoral large Holothurians in Sagami Sea. I have before me 9 specimens, all collected by Mr. Aoki in 1908; one of them serves as the type under Mus. No. 1751.

*Measurements of Carapus sagamianns.*

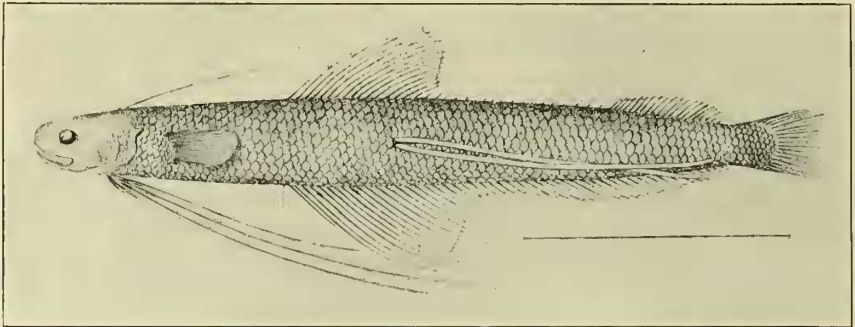
Specimen	A.(Type)	B.	C.	D.	E.
Total length .. .. .	19.0 cm.	15.5 cm.	13.0 cm.	—	15.5 cm.
Height of body .. .. .	1.2 "	1.1 "	0.8 "	1.2 cm.	1.0 "
Length of head .. .. .	1.9 "	1.6 "	1.4 "	1.7 "	1.6 "
Length of snout .. .. .	0.45 "	0.4 "	0.3 "	0.35 "	0.4 "
Horizontal diameter of eye .. .. .	0.4 "	0.4 "	0.3 "	0.45 "	0.35 "
Interorbital width .. .. .	0.4 "	0.4 "	0.35 "	0.35 "	0.35 "
Length of maxillary .. .. .	0.75 "	0.8 "	0.7 "	0.8 "	0.8 "
Length of pectoral .. .. .	0.65 "	0.4 "	0.5 "	0.4 "	0.35 "
Distance between tip of snout and origin of dorsal .. .. .	3.4 "	2.8 "	2.65 "	3.1 "	2.7 "
Distance tip of lower jaw and origin of anal .. .. .	1.9 "	1.6 "	1.6 "	2.0 "	1.5 "



**7. *Bregmaceros atlanticus japonicus*, n. subsp. (Gadidae.)**

Head  $6\frac{1}{5}$ , height of body  $8\frac{1}{2}$  in total length without caudal; eye about 4, interorbital about 3, snout  $3\frac{1}{3}$  in head.

Body elongate, compressed; highest part of body in front of the middle of body; caudal well separated from vertical fins. Head moderate, compressed; eye small; interorbital convex, its middle parts almost flat; snout short, rather pointed. Mouth subinferior, oblique, parallel to ventral contour of head; maxillary slightly enlarged and posteriorly exposed, extending to vertical from the posterior rim of the pupil of eye. Jaws equal, each with one row of rather small teeth, those on lower jaw being somewhat larger; none on vomer and palatines. Gill-membranes united forward and downward, free from isthmus;



*Bregmaceros atlanticus japonicus* Tanaka. Type.

pseudobranchiae undeveloped; gill-rakers on first gill-arch very small and pointed; branchiostegals 7 in number. Cephalic appendage slender, originating from occiput and scarcely extending to origin of first dorsal. First dorsal inserted slightly nearer to origin of second dorsal than to tip of snout and a little behind insertion of anal. Two dorsals connected by a row of detached, very inconspicuous finlets, so that the dorsals appear to be separated from each other at first sight; first dorsal much higher than the second, its highest ray equaling the length of head without snout. Anal of 2 fins, but several rays connecting the fins higher than the corresponding rays of dorsals and more or less confluent with the two anals, so that there exists no marked boundary between the anals and

the finlets; first anal much higher than the second, its height greater than length of head. Pectoral small, situated on the middle of body side, pointed posteriorly; the length equaling to distance from centre of pupil to posterior end of head. Ventrals apposed to each other before origin of pectoral and scarcely extending to origin of second anal. Caudal slightly emarginate. Scales cycloid, caducous; no lateral line.

Colour in formalin dusky; back very dark; dorsals, pectorals and caudal dark; ventrals and anals dusky; inner lining of operculum black. Air-bladder absent.

The species stands closer to *Bregmaceros atlanticus* Good & Bean\* than to *Bregmaceros maccllellandii* Thompson as described and figured by Day† or Günther‡. The species is of a more slender form and has the rays of vertical fins more numerous than in *Bregmaceros atlanticus*, as judged from the description and figure of this species. I think the specimens before me are to be considered to represent a local form or subspecies rather than to be specifically distinct.

Four specimens were obtained in Sagami Sea in 1908. The type is registered No. 2015 in the ichthyological collection of the Zoological Museum, Science College.

*Measurements of Bregmaceros atlanticus japonicus.*

Specimen	A. (Type.)	B.
Total length ex. of caudal .. .. .	6.9 cm.	6.8 cm.
Length of head .. .. .	1.0 "	1.0 "
Height of body .. .. .	0.8 "	0.8 "
Horizontal diameter of eye .. .. .	0.2 "	0.3 "

\* Good & Bean, Oceanic Ichthyology, 1896, pp. 388-389, pl. cxv, fig. 331.

† Day, Fishes of India, 1878, p. 418 pl. xci, fig. 1.

‡ Günther, Challenger Report, vol. XXXI, Pelagic Fishes, 1889, pp. 25-26, pl. iii. fig. A.

Interorbital width .. .. .	0.25 cm.	0.35 cm.
Length of snout .. .. .	0.3 "	0.3 "
Height of rays of first dorsal .. .. .	1.4 "	1.5 "
Length of ventral.. .. .	3.4 "	3.6 "
Number of dorsal spine and rays .. .. .	I-15-20-20	I-17-20-23
Number of anal rays.. .. .	23-6-23	32-2-24
Number of pectoral rays .. .. .	16	17
Number of ventral rays .. .. .	5	5
Number of scales in lateral series .. .. .	72	75
Number of scales in transverse series .. .. .	13	14

### 8. *Malthopsis annulifera*, n. sp. (Ogocephalidae).

Head about 2, its width at posterior margin  $1\frac{2}{3}$ , height of body  $5\frac{1}{3}$  in total length measured from tip of supraoral spine to root of middle caudal rays; eye  $4\frac{1}{3}$ , interorbital  $5\frac{1}{3}$ , snout measured from tip of supraoral spine to eye  $8\frac{3}{4}$  in head. D. 4. A. 4. P. 8 or 9. V. I, 5. C. 9.

Head triangular, its base very slightly longer than sides; vent midway between tip of snout and base of caudal; upper surface of head gently elevated, the under surface being flat; tail parts behind vent slightly broader than high, convex above, flat beneath. Eye large, impinging on upper profile; interorbital slightly convex; supraoral spine on tip of snout, stout and rather short. Mouth cleft extending to anterior edge of pupil; width between maxillaries equal to diameter of orbit; a groove above mouth containing a small rostral tentacle, the cavity being a little deeper than wide. Distance from tip of upper jaw to anterior rim of eye equal to about one-half diameter of orbit. Width of trunk at axil  $4\frac{1}{4}$  in total length without caudal; its height 5 in the same length. Dorsal as well as anal without membrane behind last ray; dorsal originating at the end of the second

third of total length without caudal; anal inserted slightly behind the middle between vent and root of caudal, or inserted entirely behind dorsal, tip of anal not reaching root of caudal. Length of the longest ray of pectoral equal to width of trunk at axil.

Cranial region elevated in front, depressed posteriorly; trunk slender, wider than high, tapering towards caudal fin. Spines on supraorbital and occipital regions rather prominent, forming 2 rows and leaving a smooth space along the median line of head. Behind occipital region a median row of spine-bearing plates running to root of caudal, forked in front of the base of dorsal fin and completely surrounding the base. Three rows of spines near outer edge of head, the middle row having larger spines anteriorly and extending forward to near the lower lip; below eye between the row and the upper row of spines about 4 large plates present; lower row of spines near outer edge of under surface, not quite reaching to below eye anteriorly. Posterior angle of head ending in a sharp triangular process with several spinules at tip. A row of plates running backward from postorbital rim continued into that on wrist; between this and the median row of plates a smooth space is present; between this lateral and the upper row of plates on outer edge of disc, about 4 plates rather closely arranged near posterior edge of the disc. Body behind vent with 3 rows of plates, upper lateral, middle and lower lateral. Plates on upper surface all with radiating ridges and a bluntly ending spine at centre. Under surface with very few plates, each without spine at centre.

Colour in formalin, gray above, pale below; 3 pairs of blackish rings; the first pair of the ring lies on an imaginary line drawn from anterior rim of eye to axil and at a point halfway of the length, diameter of the ring of this pair being  $\frac{2}{3}$  diameter of pupil; rings of the second pair closer to each other than to the first pair and separated from each other by a space equal to interorbital width, each ring rather elliptical than circular in shape, the longer diameter being

slightly longer than that of pupil, and the ring on the right side set off by a blackish septum, so that here the two rings are apposed antero-posteriorly; rings of the third pair separated from each other by a narrower space than in the first pair, situated at a point slightly anterior to an imaginary line drawn through the posterior edge of disc, each ring slightly smaller than that of the first pair. All the fins except ventral dusky, without distinct markings. Ventral slightly paler, also without markings.

The species is allied to *Malthopsis tiarella* Jordan, but differs from this in the shorter dorsal and in markings.

A single specimen was collected by Mr. Aoki in Sagami Sea, in 1908. It is contained in the Zoological Museum, Science College, under Mus. No. 1754.

*Measurements of Malthopsis annulifera.*

Total length (measured from tip of supraoral spine to root of middle caudal rays) .. .. .	7.5 cm.
Height of body (at postorbital rim) .. .. .	1.4 "
Height of caudal peduncle .. .. .	0.55 "
Width of caudal peduncle (at root of caudal) .. .. .	0.6 "
Length of head (measured from tip of supraoral spine to gill-opening) .. .. .	3.5 "
Width of head (at its base) .. .. .	4.5 "
Length from tip of supraoral spine to posterior end of outer edge of disc. . . . .	4.3 "
Horizontal diameter of eye .. .. .	0.85 "
Interorbital width .. .. .	0.65 "
Length of snout (measured from tip of supraoral spine to eye) .. .	0.4 "
Height of trunk at vent. . . . .	1.2 "
Width of trunk at vent. . . . .	1.4 "
Distance from tip of supraoral spine to origin of dorsal .. .. .	4.8 "
Distance from tip of lower jaw to vent .. .. .	3.4 "
Distance from vent to origin of anal .. .. .	1.8 "
Distance from posterior end of base of dorsal to origin of caudal. .	2.1 "
Length of the longest rays of dorsal .. .. .	0.85 "
Length of the longest rays of anal .. .. .	1.0 "
Length of caudal .. .. .	1.5 "

December, 1908.